Anesth Prog 39:215–220 1992

Dental Fear in Japan: Okayama Prefecture School Study of Adolescents and Adults

Philip Weinstein, PhD,* Tsutomu Shimono, DDS, PhD,† Peter Domoto, DDS, MPH,* Kyoko Wohlers, DDS, MPH,* Seishi Matsumura, DDS, PhD,† Mitsuharu Ohmura, DDS,† Hisashi Uchida, DDS,† and Koichi Omachi, DDS, PhD†

*Department of Dental Public Health Sciences and Pediatric Dentistry, University of Washington, Seattle, Washington; †Department of Pediatric Dentistry, Okayama University, Okayama, Japan

A total of 3,041 students and staff in middle school in Okayama Prefecture, Japan, were surveyed regarding dental fear. Over 88% reported fear, with 42.1% classified as having high fear. Almost 70% reported acquiring dental fear prior to junior high school. A majority reported being hurt at the last appointment. Delay of dental work was also reported for over 50% of the sample. Coping, pattern of physiological upset, nondental fears, and sex and age differences were also reported. Results suggest intervention is needed to address the major dental public health problems associated with dental fear.

Cultural factors shape the health and disease patterns of a community.[1] Dental fear and avoidance, a common and perhaps universal problem, may manifest itself differently in various cultures. Most studies of dental fear have been conducted with North American and Northern European populations and have suggested common patterns of fear and avoidance.[2–11] Until recently there have been few studies with non-Western populations.

In 1988, Domoto and associates[12] reported the results of a dental fear survey conducted with Japanese college students. Results indicated an 80% prevalence of dental fear and a pattern of delay but not cancellation of dental appointments. This preliminary study led to a study using a convenient population of Japanese nationals residing in Seattle.[13,14] Results with an expanded survey instrument indicated that only 17.9% were not afraid. Most acquired their fear in early childhood. While utilization of Japanese in Seattle was lower than in a representative sample of Americans residing in Seattle,[10] more than two-thirds of the Japanese respondents reported being hurt at the last appointment. Japanese report of dentist haste was associated with being hurt. Japanese coping practices appear to differ from those used by Americans. For example, 14.7% of the Japanese in Seattle[14] and 28.2% of the Americans in Seattle[10] requested the dentist to stop treatment.

This study attempts to add to our knowledge by assessing the fear levels of a large population of Japanese adolescents and adults in a middle-sized Japanese urban environment. Comparisons are made with data collected previously: data from our study of Japanese patients residing in the Seattle area,[14] and an earlier study of dental fear of Americans in Seattle.[10]

METHODS

From Fall 1988 to Spring 1989, students and staff in middle school in Okayama Prefecture were surveyed. A total of 3,041 respondents participated and completed our instrument in their classrooms. Of the respondents, 1,706 (56.1%) were identified as female, 2,590 (85.2%) were adolescents, and 451 (14.8%) were adults.

The survey instrument used to assess dental fears, previous dental experiences, self-perceived state of dental health, and demographic characteristics was identical to that employed in a previous study[13,14] and was based on the survey developed by Milgrom et al.[10] Translation of the original instrument into Japanese by a native Japanese and back to English by another person verified that the meanings and implications of the questionnaire were preserved during the translation process.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Subjects were categorized as having high fear if they reported being either somewhat

Received December 14, 1991; accepted for publication September 30, 1992.

Address correspondence to Dr. Philip Weinstein, Department of Dental Public Health Sciences, University of Washington, Seattle, WA 98195.

ISSN 0003-3006/92/$6.00

Table 1. Prevalence of Dental Fear

Fear Level	*Japanese in Okayama (%)*	*Japanese in US[a] (%)*	*US[b] (%)*
Not at all afraid	18.2	17.9	49.8
A little afraid	39.7	40.3	29.8
Somewhat afraid	21.2	29.2	13.1
Very afraid/terrified	20.9	12.6	7.3

[a] Data from Domoto et al.[14]
[b] Data from Milgrom et al.[10]

afraid, very afraid, or terrified of dental treatment. (Previous research indicates such self-report of fear is associated with dental avoidance.[10]) Throughout the analysis, responses of "high fear" and "low fear" groups were compared using Student's *t*-tests, χ^2 statistics, or Pearson correlation coefficients.

RESULTS

Prevalence of Dental Fear

Over 80% of all Japanese in the Okayama sample reported fear of the dentist, with 39.7% acknowledging being a little afraid, 21.2% being somewhat afraid, and 20.9% being very afraid or terrified. Combining the latter two groups yields a 42.1% rate of high dental fear. Differences between adolescents and adults were minimal, with adults reporting a slightly higher rate of dental fear (43.4% versus 39.8%). Table 1 compares the prevalence of dental fears for Japanese in Okayama with previous values obtained from Japanese residing in Seattle,[14] and an American/Seattle sample.[10] The age at which dental fear was acquired by highly fearful respondents was varied. Almost 70% (69.9%) reported they first acquired their fear prior to junior high school; 16.7% noted initial fear in junior high school, and 14.4% reported acquisition in high school or later.

Objects of Fear

As shown in Table 2, most respondents worried over drilling and injections but were relatively unconcerned about teeth cleaning. The percentage of Japanese respondents reporting being hurt at the last appointment was 59%. Figure 1 contrasts both Japanese samples with the relatively low percentage of the US sample reporting pain.

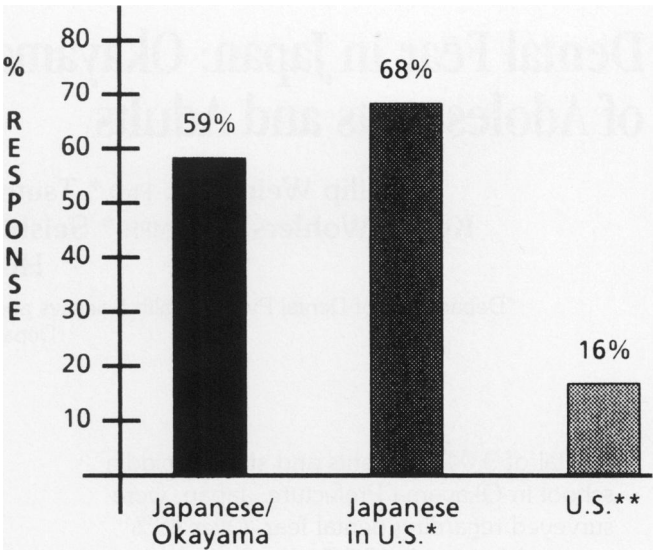

Figure 1. Percentage of Japanese respondents hurt at the last dental experience compared with similar data obtained from Japanese living in Seattle (* = Domoto et al[14]) and from American residents (** = Milgrom et al[10]).

Utilization and Fear

Fear of dental work was reported to delay the making of dental appointments for over 50% of the sample (Figure 2). Only 32.6% of the Okayama sample reported seeing a dentist within the last year. Twenty-seven percent admitted to a hiatus of 1 to 2 yr; 24.5% noted 2 to 5 yr; and 13.3% kept away for more than 5 yr (2.4% did not answer the question). Respondents reported the dental procedures accomplished at their last dental visit (Table 3).

During the past 12 mo many patients reported problems. Almost three of four reported sensitive teeth, and a majority complained of toothaches and other problems. Only 28.6% reported no current dental problems. Esthetics was also a concern, as 56% were somewhat or very dissatisfied.

Table 2. Percentage of Respondents Worried About Receiving Specific Dental Treatments

Question: To what degree do you worry about receiving . . .	*Degree of Worry*				
	Not at All (%)	*A Little (%)*	*Somewhat (%)*	*A Great Deal (%)*	*Almost Constantly (%)*
oral injections?	12.1	26.4	22.4	22.5	16.7
drilling?	8.4	20.0	20.2	20.2	22.8
tooth cleaning?	34.3	32.0	18.2	9.9	5.6

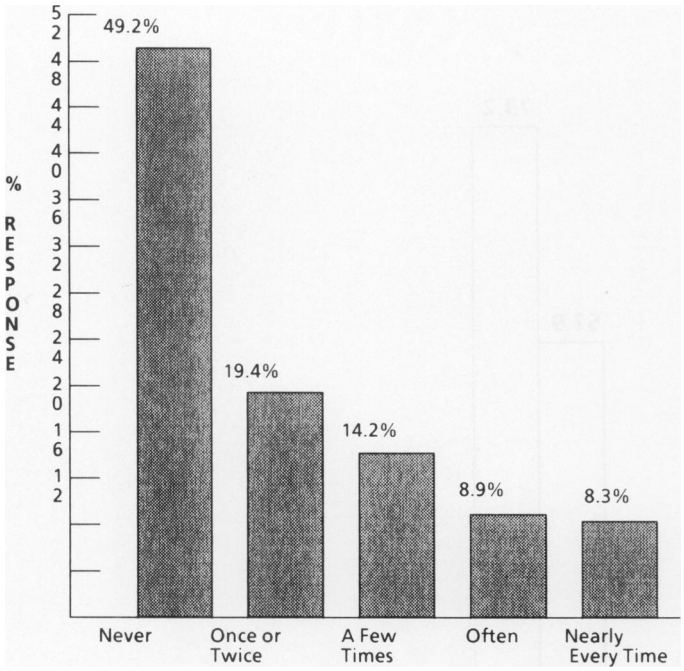

Figure 2. Percentage of Japanese respondents who put off dental appointments because of fear.

Coping

Japanese respondents were not very comfortable in asking questions of their dentists; only 25.6% were comfortable while 35% noted discomfort, and 39.4% did not remember. Self-medication with tranquilizers and alcohol was rare, reported by less than 5% of the adult sample. Cancellation due to fear was low, being reported by only 17% of the entire sample.

Pattern of Physiological Upset

Figure 3 presents responses to questions about physiological upset for males and females. Results indicate little fainting and panic, but considerable difficulty with swallowing and breathing, and instances of heart pounding and gagging. Some gender differences are also apparent. Females reported significantly more difficulty swallowing, feeling panic, heart pounding, and gagging (all differences significant at $P < 0.05$). Males reported significantly more difficulty breathing. No differences were found for feeling faint.

Nondental Fears

Responses to questions about nondental fears are presented in Table 4 for Japanese and American samples. Results indicate a Japanese willingness to express a wide range of strong fears. Fear of death was extremely strong, with almost 60% of the sample indicating "very much" fear. Considerable fear of heights, enclosures, illness, and injury was also reported. Japanese responses indicated considerably more fear than the response of the US sample.[10]

Sex and Age Differences

Females reported greater dental fear for the vast majority of items. For example, females indicated significantly greater overall dental fear and worry regarding injection and drilling procedures. Nondental fears, (eg, heights, enclosures, and death) were also significantly higher for females on all items.

Additional age differences were also identified. Adults reported fewer cancellations. They were less likely to perceive dentists to be in a hurry and were more comfortable asking questions. While reporting lower levels of dental health, older subjects were more likely to have a personal dentist and go to a dentist when they had an emergency.

DISCUSSION

While the sample of subjects used in this study was not representative of the Japanese population, it nevertheless confirms previous findings that dental fear and avoidance appears to be a public health problem in Japan.[12,14] More than two of five Okayama subjects indicate high levels of fear; such levels of fear have been shown to lead to avoidance of dental care in a US sample.[10] Moreover, the frequency of delay of dental treatment due to fear is high. Evidence generated from both Japanese and US subjects suggests that dental fear is acquired primarily in childhood[10] and that it may persist to influence adult behavior.

It is not surprising that Japanese subjects have considerable fear of injections and drilling but not tooth cleaning. Most Okayama subjects were young, with less experience with periodontal disease and its treatment. These results are consistent with those of Kleinknecht et al[6] involving

Table 3. Percentage of Respondents Reporting Various Procedures at Their Last Dental Visit

Procedure	*Okayama Japan (%)*	*US[a] (%)*
Filling	79.0	33.3
Cleaning	43.2	73.6
Extraction	19.0	8.7
Root canal	26.7	5.9
Bridge or crown	13.6	
Injection	42.9	40.5

[a] Data from Milgrom et al.[10]

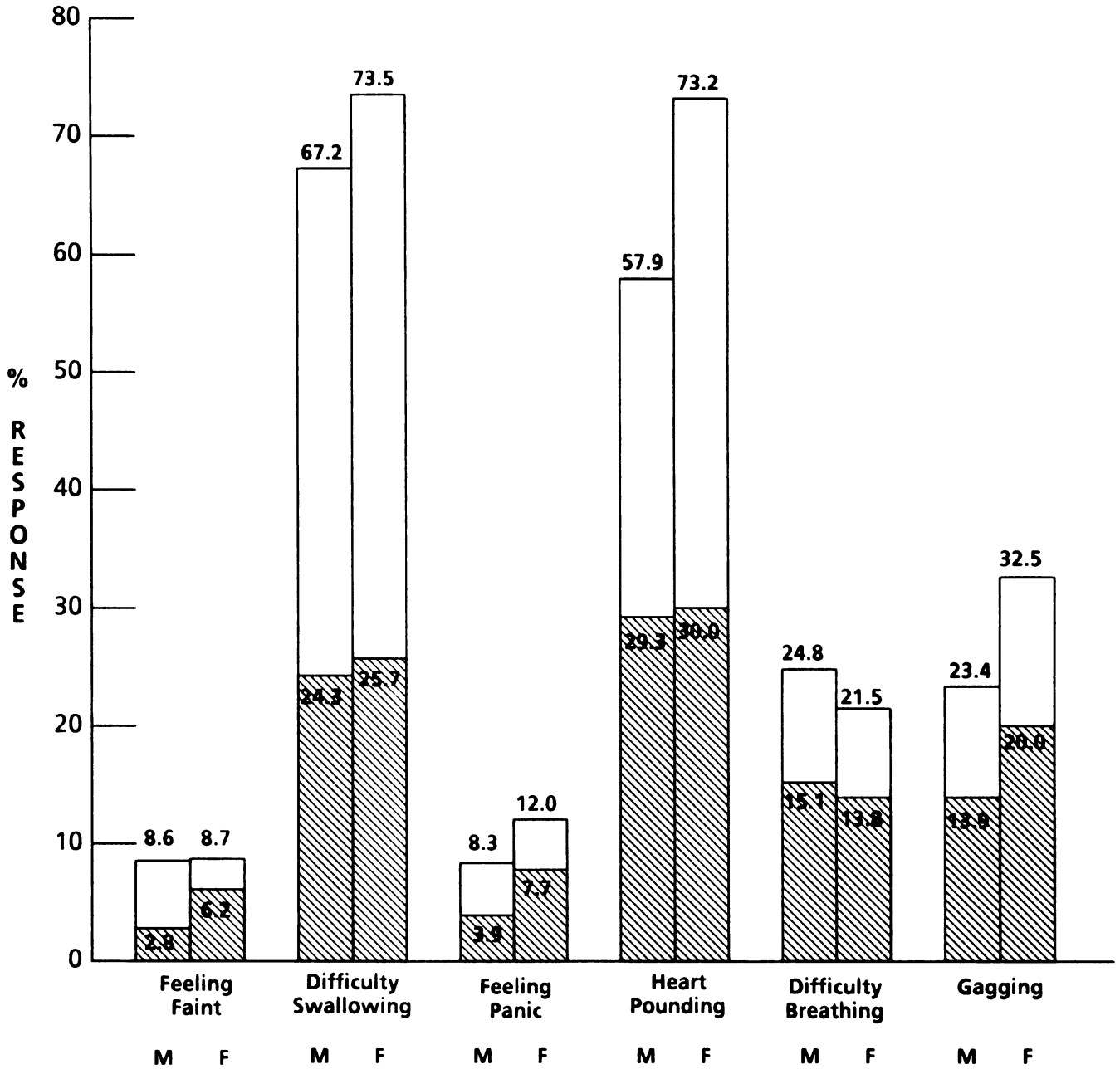

Figure 3. Percentage of male (M) and female (F) Japanese respondents who reported various physiological disturbances associated with dental treatment. ▨ = upsets occurring "once or twice"; □ = upsets occurring "a few times" or "often."

college-age students. Milgrom et al[9] found greater fear for tooth cleaning with an older American population.

Over three and a half times more Japanese reported pain at the last dental visit than did US subjects.[10] This result is slightly lower than the pain reports provided by Japanese residents in Seattle,[14] who may have been sensitized to the differences between dental care in the US and Japan. Our experience leads us to believe that, in Japan, dentists may be less concerned with controlling pain than in the US. Japanese dentists may not use local anesthetics regularly, or, if they do, they may use less than the required volume to induce anesthesia.

Traditionally, communication between the Japanese dentist and patient is one-way. Japanese patients may not be able to directly communicate their pain to the dentist. The dentist, in turn, may not be trained to attend to the patient's discomfort. Economics may also play a role in inadequate pain control. Dentists may rush through procedures to control costs and may assume patients are not willing to pay for more time.

Table 4. Percentage of Respondents Reporting Nondental Fears

	Very Little		*Some*		*Very Much +*	
Type of Fear	*Japanese (%)*	*US[a] (%)*	*Japanese (%)*	*US[a] (%)*	*Japanese (%)*	*US[a] (%)*
Heights	34.6	22.3	21.8	19.3	24.3	16.4
Enclosures	25.9	15.5	27.9	10.9	26.0	6.1
Flying	28.7	12.8	16.0	8.0	13.8	9.1
Illness	28.4	20.4	27.7	15.2	25.6	4.3
Death	12.8	24.1	19.0	16.7	59.1	6.9
Injury	29.3	26.2	30.1	19.8	25.0	6.5
Storms	30.3	11.4	19.1	5.7	9.3	2.5
Traveling alone	32.5	12.2	13.0	6.6	4.9	2.6
Being alone	25.6	11.3	7.0	5.5	4.4	2.5

[a] Data from Milgrom et al.[10]

Dental care in Japan is still largely symptomatic, with a very high percentage of fillings, extractions, and root canals. Utilization is low; only about one in three Japanese have seen a dentist within the last year. Almost three-fourths of the sample indicated they had problems in their mouth, and over half were dissatisfied with the esthetics of their mouth. While prevention-oriented dental care exists, it is in its infancy in Japan.

It appears that fearful Japanese patients neither cope by communicating their fear, nor by canceling appointments or "self-medicating." As good patients, they place themselves in dentist's hands for necessary treatment, rarely questioning the dentist or expressing their feelings, but then avoiding subsequent care as long as possible. Until recently, Japanese dentists, relying on large numbers of patients presenting themselves with various symptoms, have not been concerned about avoidance behaviors. However, as economic factors have influenced Japanese dentists to recognize underutilization, concern with patient and practice management may increase.

The Japanese subjects' report of considerable physiological arousal in the dental office is not unusual. Japanese are sensitive about the body and are comfortable in disclosing information concerning its functioning. Ohnuki-Tierney[15] notes that frequent discussion of one's own health is common in Japan, and mention of illness does not compromise masculinity, dignity, or social standing. While males and females reported different patterns of physiological upset, the high rates of reporting arousal of both sexes is remarkable. Similarly, the high level of nondental fears fits with what we know of the Japanese from the cross-cultural literature.

Tsujioka and Cattell[16] and Cattell and Warburton[17] compared students in the US with Japanese and British students. It was found that Japanese are more cautious and introverted than Americans and British. On the other hand, developmental studies show that, whereas adult Japanese have a higher level of anxiety than Americans, Japanese 9-yr-olds have significantly lower levels of anxiety than similar aged children in France and the US.[18] It appears that anxiety and fear are not unknown concepts in Japan and that culturally appropriate ways to discuss fear are possible.

Trends in Japanese dental education may assist educators desiring to provide students with instruction on how to treat fearful patients. Recent but minor changes in the dental curriculum have been reported and include attention to patient psychology and behavioral science.[19] Research in the US indicates that anxiety and general distress are far more difficult to detect than pain responses.[20] Of paramount importance is instruction in the recognition of dental fear and discussion of its relationship to avoidance and underutilization of dental services. Changes in standards of pain control are also necessary to be able to control dental fear. For example, students should be taught that acceptable dental care eliminates pain from dental procedures by careful and effective administration of local anesthesia.

Children with dental disease are at a high risk for fear. Whether or not fear is acquired may determine the child's future dental health. All too often dentists respond to rampant caries and other forms of childhood disease with aggressive management. Unfortunately the use of such tactics enhances the risk for acquiring fear. Alternative treatments, such as arresting agents, and chemical caries removal systems are available. Also, transcutaneous electrical nerve stimulation (TENS) has been shown to control pain without other forms of anesthesia. Moreover, behavioral and pharmacological treatments that do not harm children do exist.[21] Perhaps most importantly, while actual disease in children can be prevented, few clinicians make the attempt.

In all, dental fear is a public health problem that has not yet been addressed in Japan and other Asian nations. Development of strong behavioral science instruction, including pain control and a preventive orientation, especially for children, will be important first steps.

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